

Problems cannot be solved at the same level of awareness that created them.

Albert Einstein (1879–1955)

REPRODUCTIVE TOXICITY

Birth Weight Raises More Questions on Seafood Safety

Women who eat too much shellfish before pregnancy, particularly crabs and lobsters, may increase their chance of having babies who are small for their gestational age (SGA), report French scientists in an article posted online 24 October 2007 ahead of print in *Environmental Health*. Eating fish, however, seems to have the opposite effect. The findings further fuel the debate over how much and what types of fish and other seafood are beneficial to would-be moms.

“Some studies suggest the omega-3 fatty acids in fish and seafood are beneficial to fetal growth and birth weight,” explains first author Laurence Guldner, an epidemiologist at the National Institute of Health and Medical Research, University of Rennes, “but others report no benefit or even a negative effect.” The new report could help explain these discrepancies, because the results distinguish between the effects of fish and shellfish, and between even more specific sub-categories of seafood—something most earlier work did not do.

The study included 2,398 pregnant women in Brittany, France, who were part of the Pélagie cohort assembled to investigate effects of environmental pollutants on pregnancy, birth outcomes, and child health and development. The researchers

gathered information on consumption in the year prior to pregnancy of saltwater fish (e.g., salmon), mollusks (e.g., oysters), large crustaceans (e.g., lobster), and small crustaceans (e.g., shrimp).

Statistical analysis, adjusted for a number of potential confounders, showed that women who ate 2 or more meals of shellfish per week had a statistically significant 2.14 greater likelihood of having an SGA baby (defined as having birth weight below the tenth percentile for a given gestational age and sex) compared with those who ate shellfish less than once per month. Those who ate fish 2 or more times per week were about half as likely to have an SGA baby than those who ate it less than once per month (a nonsignificant finding).

“Most of the negative effect of seafood on SGA was [associated with] eating large crustaceans, like crabs and lobsters,” explains Guldner. He suggests that high tissue concentrations of persistent organic pollutants such as dioxins and polychlorinated biphenyls accumulated by these animals may cancel out the potential beneficial effect of their omega-3 fatty acids.

Indeed, the results of some other studies have suggested that low-level exposure *in utero* to such pollutants may have a negative effect on birth weight. However, the evidence to date is inconclusive.

“Unfortunately, no distinction was made between the fish types eaten [in this study],” cautions Thorhallur Ingi Hallardsson, a researcher at the State Serum Institute in Copenhagen, Denmark. “We should [therefore] be careful in promoting fish as beneficial for fetal growth. Oily fish is a good source of omega-3 fatty acids, but high consumption can lead to higher body burdens of organic pollutants, which might affect growth.” Hallardsson adds that regular consumption of varying fish types should therefore be encouraged.

Rosa Ortega, a professor of nutrition at the Complutense University of Madrid, Spain, adds, “It would certainly be a good idea for women to make sure their seafood comes from guaranteed clean waters. But with everything in moderation, a new mother-to-be is probably still safe to satisfy her craving for a lobster dinner.” —Adrian Burton



Eat now, pay later? Although it's too soon to put the kibosh on lobster, a seafood study suggests that high crustacean consumption may be linked to low birth weight.

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STANDARDS

New Yardstick for Medicinal Plant Harvests

Every year more than 400,000 tons of medicinal and aromatic plants from approximately 3,000 species are traded internationally, according to TRAFFIC, a nonprofit watchdog group that monitors commerce in natural products. (Up to 70,000 species are used medicinally worldwide, most of them locally.) Such a growth in demand for these plants threatens natural resources, since about 80% of commercially traded species are gathered from the wild, according to the World Conservation Union (IUCN). In February 2007, several groups concerned about potential adverse effects of this rise on plant habitats announced an international standard designed to preserve nature's medicine chest for future generations. A year later, the standard appears to be bearing fruit.

The IUCN Medicinal Plant Specialist Group, IUCN Canada, the German Federal Agency for Nature Conservation, WWF Germany, and TRAFFIC proposed the standard and coordinated several rounds of international vetting in 2005 and 2006. The new International Standard for Sustainable Wild Collection of Medicinal and Aromatic Plants (ISSC-MAP) is intended to balance the needs of people whose traditions and livelihood depend on these species with the plants' long-term survival in their native habitats.

The new standard is based on six principles related to maintaining wild resources, preventing negative environmental impacts, respecting customary rights (for example, of indigenous populations), and exercising responsible management and business practices. Plant scientists also drew on earlier guidelines both for the conservation of medicinal plants and for good agricultural and collection practices. "We did not want to reinvent the wheel," says Susanne Honnef, TRAFFIC medicinal plant officer with WWF Germany, "so the standard builds on existing frameworks."

The new standard involves all actors along the supply chain—from wild plant harvesters to sellers—in a process for determining how to sustainably conduct harvests and trade, says Honnef. The standard also outlines practices for monitoring the impact of harvests over time.

Honnef says the standard will protect important natural resources. As the benefits of sustainable use become more broadly

recognized, harvesters will be encouraged to protect the ecosystems that support their livelihoods. And government agencies will have tools for defining benchmarks in a trade that is often informal and that falls through the cracks between groups that manage agriculture and forestry.

The standard was tested in preliminary trials undertaken in six countries. Over 6 months in 2007, for example, 2 Indian communities used the standard to gauge population health of 6 commercially traded species, says Giridhar Kinhal, special projects coordinator for Foundation for Revitalisation of Local Health Traditions, a nonprofit scientific and research organization in Bangalore. Based on that trial, says Kinhal, the communities saw improved regeneration of the studied plant populations, but also reported the need for further guidance in assimilating these outcomes into resource management. Next comes a 2-year implementation phase at sites in Asia, Africa, southeast Europe, and South America.

Danna Leaman, chair of the IUCN Medicinal Plant Specialist Group and a member of the advisory group that guided the development of ISSC-MAP, says, "A concrete activity like this is a real step forward" for the IUCN, which has worked for years to engage industry in biodiversity protection. Indeed, ISSC-MAP goes even further than current guidance such as Fair Trade and Organic certification.

For example, it has been up to individual inspectors to determine whether a wild collection operation meets the requirements for Organic certification. Josef Brinckmann, vice president for research with manufacturer Traditional Medicinals, says that although the wild botanicals they use qualify for Organic certification, some sites will need further work to conform with all 6 principles of the ISSC-MAP. "Many of these certified Organic wild collection sites would need a few years to make the necessary changes for conformance with the ISSC-MAP standard," he says. Yet, Brinckmann adds, the extra work will be worthwhile if compliance with the standard can help a company demonstrate unequivocally that its operations help maintain the botanical resource.

Brinckmann points to Asia and Europe as places where the standard may first have a significant impact in alleviating intense harvest pressures. "China and India are the two largest producers and exporters of medicinal plants in the world," he notes. Southeastern European countries and Russia are also important in the world market. —David A. Taylor

GreenChill Partnership

Several U.S. supermarket chains have teamed up with the EPA and the refrigerant and refrigeration industries in a voluntary program to curb emissions that can exacerbate climate change. The GreenChill Advanced Refrigeration Partnership seeks to reduce refrigerant emissions over regulatory requirements as well as assess the performance of new refrigeration technologies. The 10 supermarket partners have also committed to use only ozone-friendly refrigerant alternatives and technologies in all their new and remodeled stores. Besides the environmental payoff, the EPA estimates these efforts will save the markets more than \$12 million each year in increased energy efficiency and reduced operating expenses.



Nonsmokers Benefit from Bans

Hundreds of municipalities across the United States have enacted some form of public smoking ban. Now a first-of-its-kind study published in Volume 37, Issue 3 (2007) of the *Journal of Drug Education* has looked at how these bans affect the health of nonsmokers. Results from 2 Indiana counties showed that hospital admissions for heart attacks among nonsmokers with no risk factors for heart disease dropped 70% within 22 months of a smoking ban going into effect. Admissions for heart attacks among smokers didn't change, however. Secondhand smoke causes blood vessels to constrict and reduces the amount of oxygen that can be transported in the bloodstream.

Malawi Fights Aflatoxins

Malawi is home to several efforts to help farmers rid their peanut crops of aflatoxins—waste products of *Aspergillus* molds that grow on improperly stored crops. Once a chief export, Malawian peanuts are now banned in the European Union because of the threat of aflatoxin contamination. An NGO known as the Food and Chemical Safety Environmental Action Team is educating Malawian farmers on safety measures, including better grain sorting and storage methods. The National Smallholder Farmers' Association of Malawi also is helping farmers meet aflatoxin safety requirements for exporting their products. This collaborative encourages better planting, harvesting, and drying practices and has trained more than 800 staffers and farmers to date. In addition, the International Crop Research Institute for the Semi-Arid Tropics has set up labs in Malawi and other countries that offer affordable enzyme-linked immunosorbent assay testing for rapid sampling of crops.



CHILDREN'S HEALTH

Do Bacteria Promote Asthma?

Newborns whose lungs become colonized with certain bacteria are more likely to develop wheezing and childhood asthma than babies not colonized by the bacteria. This connection, reported in the 11 October 2007 issue of the *New England Journal of Medicine*, raises the possibility that controlling bacterial colonization in neonates may lower the prevalence of childhood asthma.

Pediatrician Hans Bisgaard, director of the Danish Pediatric Asthma Center at Copenhagen University Hospital, and colleagues studied 321 asthmatic mothers and their infants for five years.

"By including mothers with asthma, we identified a high-risk cohort where we expect to see more children with asthma," says Bisgaard. A family history of asthma raises the risk for childhood asthma.

At 1 month and 12 months of age, the babies were tested for *Streptococcus pneumoniae*, *Haemophilus influenzae*, *Moraxella catarrhalis*, and *Staphylococcus aureus*. The first three pathogens cause pneumonia, whereas *S. aureus* commonly infects the skin. Parents recorded the children's respiratory symptoms, such as wheezing

and persistent cough, in daily diaries. Physicians examined the children for asthma when they reached 5 years of age.

One-fifth of newborns were colonized with *S. pneumoniae*, *H. influenzae*, *M. catarrhalis*, or some combination thereof, and the presence of 1 or more of these microbes was associated with a 2.4 times greater risk of persistent wheeze and a 3.85 times greater risk of hospitalization for wheezing. Moreover, babies harboring any of these bacteria were about 3 times as likely as children without them to develop asthma by age 5 years. The presence of *S. aureus* was not linked to wheezing or asthma, nor was this bacterium found to colonize the airways of any of the children at age 12 months.

During the first month of life, "children genetically disposed to asthma may be inefficient at clearing pathogenic bacteria from the airways," proposes Bisgaard as an explanation of his observations. Neonates' immature immune systems may also be more susceptible to bacterial damage that initiates inflammation leading to asthma, he says. Bisgaard plans to treat a future group of pregnant women and neonates with probiotics (potentially beneficial bacteria) to assess whether such therapy prevents childhood asthma.

"The study raises good questions about immune imbalance associated with asthma," says Stanley Szefer, head of pediatric clinical pharmacology at the National Jewish Medical and Research Center in Denver. However, he notes, "the positive cultures may be due to an immune imbalance shortly after birth that could lead to bacterial colonization, yet the bacteria [themselves] may not be the direct cause of asthma." An editorial in the same issue of the *New England Journal of Medicine* makes a similar point—the Danish researchers may have discovered a "new sentinel" for the development of asthma rather than a "causative signal," writes Erika von Mutius, a professor of pediatrics at the University of Munich. —Carol Potera

DIET & NUTRITION

Expert Panel Weighs In on Global Cancer Control

Cancer originates in genetic mutations, but diet, activity level, and other lifestyle factors play a critical role in determining whether these mutations occur, making cancer a largely preventable disease. This is among the main conclusions of *Food, Nutrition, Physical Activity, and the Prevention of Cancer: A Global Perspective*, released in November 2007 by the World Cancer Research Fund (WCRF) International and the American Institute for Cancer Research (AICR).

WCRF International/AICR commissioned 9 systematic literature review (SLR) teams comprising 22 panelists to summarize the literature on nutrition, physical activity, and cancer. The teams examined 7,000 articles, reviews, and meta-analyses in all languages. Team findings went to an international panel that synthesized information for many different cancers to come up with the report's main recommendations.

The report lays out a cogent groundwork for understanding how diet, exercise, and other lifestyle factors affect cancer risk,

as well as how to use this information for more effective cancer prevention on a global scale. The public policy implications of the recommendations will be the subject of a further report to be published in late 2008.

The report concluded that about 40% of all cancers are linked to poor diet, physical inactivity, and suboptimal body weight. The panelists recommend maintaining a body mass index of between 21 and 23 (until now, the standard recommended range has been 18.5 to 24.5), exercising moderately, and limiting consumption of alcohol, high-fat foods, and refined carbohydrates such as sugary beverages. In addition to increasing vegetable intake, the report suggests replacing red meats and processed meats with poultry, fish, and eggs.

"The conclusions are really not surprising, but what did surprise me was the universality of the recommendations across so many countries," says Tim Byers, a preventive medicine professor at the University of Colorado Cancer Center in Aurora. "I was surprised to find that nutritional factors that can lower cancer risk are shared widely across the world. . . . The importance of this report, therefore, is both that it is comprehensive and also that it is global."

An earlier WCRF International/AICR report, published in 1997, stated that

Report Recommendations for Reducing Cancer Risk

1. Be as lean as possible without becoming underweight.
2. Be physically active for at least 30 minutes every day.
3. Avoid sugary drinks. Limit consumption of energy-dense foods (particularly processed foods high in added sugar, low in fiber, or high in fat).
4. Eat a variety of vegetables, fruits, whole grains, and legumes such as beans.
5. Limit consumption of red meats (such as beef, pork, and lamb), and avoid processed meats.
6. Limit alcoholic drinks to 2 a day for men and 1 a day for women.
7. Limit consumption of salty foods and sodium-processed foods.
8. Don't use supplements to protect against cancer.
9. Mothers should breastfeed exclusively for up to 6 months before adding other liquids and foods.
10. After treatment, cancer survivors should follow these recommendations for cancer prevention.

"cancer is principally caused by environmental factors, of which the most important are tobacco, diet and factors related to

ehpnet

Healthy House Institute

The mission of the Boise, Idaho-based Healthy House Institute (HHI) is to educate homeowners on ways to make and keep their home environments as healthful as possible. Toward this end, the HHI has compiled data in areas including indoor air, drinking water, building and remodeling, housekeeping, and energy efficiency on its website, <http://www.healthyhouseinstitute.com/>.

Information is presented in seven topic categories: Air, Building, Design, Energy, Health & Safety, Materials & Furnishings, and Water. Each topic page presents resources organized by four information types: Reviews; Tools; Articles, Hints, & Tips; and Books & Videos. The Reviews category links to overviews of products inspected by HHI that perform well in such areas as safety, energy use, allergen reduction, and use of chemicals. The Tools category lists products that can be used in building or remodeling to make a healthier home. These include paints and coatings, lighting fixtures, indoor air cleaners, and pest control strategies.

The Articles, Hints, & Tips section provides information on new green products, how to choose sustainably produced building materials, green roofs, and energy efficiency. The Books & Videos page lists educational materials such as *Green Building A to Z* (an introduction to sustainable housing), *Green Clean* (a primer on eco-friendly housekeeping), and *The Mold Survival Guide* (which offers advice on eradicating mold while minimizing health risks). Visitors can also consult the "HHI-pedia," a list of definitions for terms used in green building and housekeeping. —**Erin E. Dooley**

diet, including body mass and physical activity, and exposures in the workplace and elsewhere." Although the panel still emphasizes the importance of not smoking and avoiding secondhand smoke, this report concentrated on the impacts of diet, activity, and weight.

Lawrence H. Kushi, associate director for etiology and prevention research at Kaiser Permanente in Oakland, California, and an SLR team co-leader, says this document is a substantial improvement over the first report in that it is more comprehensive. Moreover, he says the report is "groundbreaking [because] it established methodologies for conducting literature reviews and meta-analyses for observational epidemiologic data."

Indeed, Kushi notes that the systematic review process relied primarily on analytical epidemiologic studies, such as prospective cohort studies and case-control studies. "Consistency of findings across these more rigorous study designs and [well-defined] populations form the bulk of the report and the basis of its recommendations," he says.

Compelling evidence for the impact of environmental factors comes from studies describing changes in the rates of different cancers in populations that migrate from

one country to another. For example, research in the 1980s showed that breast cancer incidence increased almost 3-fold in first-generation Japanese women who migrated to Hawaii, and up to 5-fold in the second generation. The migrant studies "prove that the main determinants of cancer patterns are environmental, and suggest that patterns of food, nutrition, and physical activity are important among these causes," the report states.

"One of the project's major strengths was the participation of many leaders in the field, from the development of the methodology, to the conduct of the SLRs, to issuing conclusions regarding the evidence and public health recommendations," says SLR team leader Elisa Bandera, an epidemiologist at UMDNJ-Robert Wood Johnson Medical School and The Cancer Institute of New Jersey. "This is a very important resource for cancer prevention and public health education. It can guide researchers in identifying research gaps quickly, and ultimately should help guide public policy changes as well." Moreover, she notes, WCRF International/AICR will update the evidence on its website as new findings emerge. For more information, go to <http://www.dietandcancerreport.org/>.

—**M. Nathaniel Mead**

Management Key To Asia's Future Water Supply

One of the main messages of *Asian Water Development Outlook 2007*, a report by the Asian Development Bank, is that proper management, not volume, is the key to maintaining sufficient water supplies in Asia in the face of increasing urbanization, industrialization, population growth, and climate change. The report emphasizes that current trends in wastewater management make it harder and more expensive to provide clean water. National policies must also consider the water needs of the energy sector, an often overlooked draw on resources. The report states that Asia has the expertise and technology to ensure an adequate supply of clean water—if that expertise and technology can be fully implemented.



A Helping Hand for HCFCs

A September 2007 adjustment to the Montréal Protocol called for production and consumption of hydrochlorofluorocarbons (HCFCs) to phase out in developing countries by 2013, 10 years ahead of the original Protocol schedule. Now UNEP and the Swedish EPA have announced they will help developing countries identify commercially available alternatives to achieve this goal. UNEP has also launched the HCFC Help Centre at <http://www.unep.fr/ozonaction/topics/hcfc.asp> to educate policy makers about HCFCs and their alternatives. Sweden has largely phased out HCFCs, which were used to replace ozone-depleting chlorofluorocarbons before they too were found to harm the ozone layer and significantly contribute to climate change.

Asthma Brochures Fail Test

Governments need to spend health dollars in ways that can benefit the most people. A study in the Autumn 2007 issue of *Ethnicity & Disease* looked at the cultural specificity of asthma education brochures distributed in Wisconsin and found that many were ineffective at educating vulnerable populations about asthma care and prevention. The authors found several translation errors in Spanish-language materials and a lack of attention to cultural issues relevant to American Indian groups (such as the use of smudging and a tendency to distrust maintenance asthma medication). There also were no materials aimed specifically at black residents, who make up a large part of the Wisconsin population and have a disproportionately high incidence of asthma. The study used a cultural competency analysis tool developed by the Wisconsin Asthma Coalition Disparities Workgroup, which the authors say could serve as a model for other states seeking to assess their own materials.

